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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,412	07/14/2006	Stephen John Elliott	BARK126856	5501
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CHRISTENSEN, O'CONNOR, JOHNSON, KINDNESS, PLLC			EXAMINER	
1420 FIFTH AVENUE			PAUL, DISLER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/560,412	Applicant(s) ELLIOTT ET AL.	
	Examiner Disler Paul	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
 4a) Of the above claim(s) 3 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1;4-17 is/are rejected.
- 7) ☒ Claim(s) 2 and 3 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/14/06</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1,5-7,9,11-13;15 are rejected under 35 U.S.C. 102(e) as being anticipated by Arai et al. (US 2003/0142842 A1).

Re claim 1, Arai et al. disclose of the sound reproduction system for providing sound to two adjacent first and second users, the system comprising first and second speaker means positioned respectively adjacent to the intended head positions of the first and second users (fig.1,4,11-18; par[0005,0008-9,0011]/desired sound for respective listener wt speakers), each speaker means comprising a pair of speakers one of which faces inwards towards the head position of the first user, and the other faces outwards from said head position and generally towards the intended head position of the second user (fig.1,7,9-17; par[0096,0102]/ multiple speakers for each seated listener), filter means controlling the input to the outwardly facing speaker relative to the input applied to the inwardly facing speaker,

the filter means being designed by adjusting the filter coefficients thereof so as to reduce the sound that would be perceived by the second user due to the first speaker means (fig.19-26; par[0074,0077,0103-0104,0107,0111,0118,0116]/ crosstalk canceller and filter characteristic correction to control sound reproduce sound within limit of both ears corresponding to head transfer function with no influence in entire space by others).

Re claim 4, the sound reproduction system as claimed in claim 1 in which the filter means has been designed by adjusting adaptive filters in an error minimisation filter design procedure (par[0103-0104]/filter design to correct filter characteristic to control sound field within listening area).

RE claim 5, the sound reproduction system as claimed in claim 1 in which the filter means has been designed by adjusting the filter coefficients such that the pressure, or the mean square pressure, at one or more discrete locations in the region of the second head position, at a particular frequency, due to sound emitted by the first and second speakers, is substantially zero (par[0107]/ the sound pressure with no influenced by acoustics of other speakers).

RE claim 6, the sound reproduction system as claimed in claim 5 in which the filter means provides a delayed and weighted version of the signal input to the filter means (fig.22; par[0111]).

Re claim 7, the sound reproduction system as claimed in claim 5 which a pre-conditioning filter means is provided in the inputs to said pair of speakers, the pre-conditioning filter means being configured to adjust the frequency response of the overall system, as experienced by the first user (fig.19 wt (Hspr, Hspl); par[0103]).

Re claim 9, the sound reproduction system for providing sound to two adjacent first and second users, the system comprising first speaker means positioned adjacent to the intended head position of the first user, and second speaker means positioned adjacent to the intended head position of the second user (fig.1,4,11-18; par[0005,0008-9,0011]/desired sound for respective listener wt speakers), a first channel connected to the first speaker means to enable, in use, the first user to listen to sound conveyed by said first channel, and a second channel connected to the second speaker means to enable (fig.1,7,9-17; par[0096,0102]/ multiple speakers for each seated listener), in use, the second user to listen to sound conveyed by said second channel, and a feedforward compensating filter means (H.sub.1, H.sub.2) having an input connected to the inputs to the first speaker

means, and an output connected to the input to the second speaker means, the compensating filter means being so configured as to provide to the second speaker means a modified version of the signals being fed on said first channel to the first speaker means, said compensating filter means having been determined to reduce the sound that would be perceived by the second user to have been emitted by the first speaker means (fig.19-26; par[0074,0077, 0103-0104,0107,0111,0118,0116]/ crosstalk canceller and filter characteristic correction to control sound reproduce sound within limit of both ears corresponding to head transfer function with no influence in entire space by others).

Re claim 11 has been analyzed and rejected with respect to claim 4.

Re claim 12, the sound reproduction system as claimed in claim 9 in which the first and second speaker means are mounted on or in first and second adjacent headrest assemblies (fig.4,7,9-18).

Re claim 13, the sound reproduction system as claimed in claim 9 in which each of said speaker means comprises respective right and left speakers positioned in use adjacent to the right and left sides of the user's head (fig.4,7,9-18).

Re claim 15, the sound reproduction system as claimed in claim 13, in which the speaker means are housed in wings of the headrest, the speakers facing generally towards the respective head positions (fig.9 (d)).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 2003/0142842 A1) and further in view of Arai et al. (US 2003/0103636 A1).

Re claim 14, the sound reproduction system as claimed in claim 13 in which the compensating filter is adapted to receive that is to the speaker means (fig.3,19 wt (4)); However, Arai et al. fail to disclose of the compensating filter means is adapted to receive a signal that is fed to only one of the speakers of the first speaker means, said one speaker being the speaker that is closer to the second speaker means. However, Arai et al. (36) disclose of the compensating filter means is adapted to receive a signal that is fed to only one of the speakers of the first speaker means, said one speaker being the

speaker that is closer to the second speaker means (fig.4 wt (15-17);fig.7; par[0051]/filer to create sound field three dimensions) for the purpose of creating selective sound signal without being influence by the other reproduced sound. thus, taking the combined teaching of Arai et al. and Arai et al. (36) as a whole, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modify Arai et al. by incorporating the compensating filter means is adapted to receive a signal that is fed to only one of the speakers of the first speaker means, said one speaker being the speaker that is closer to the second speaker means for the purpose of creating selective sound signal without being influence by the other reproduced sound.

5. Claims 8,10, 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (US 2003/0142842 A1).

Re claim 16, the sound reproduction system as claimed in claim 9 in which the compensating filter means comprises a series of filter coefficients calculated (fig.21-23; par[0118]), However, Arai et al. fail to disclose of the specific wherein the filter coefficient being for a range of frequencies extending up to about 400 Hz. However, official notice is taken the concept of having filer coefficients calculated for certain frequencies or specifically extending to about 400 Hz is simply the inventor's preference, thus it would have been

obvious for one of the ordinary skill in the art to have modify Arai et al. by incorporating the filter coefficients calculated for certain frequencies or specifically extending to about 400 Hz for producing accurate sound field according to the user's head functions.

Re claim 17 has been analyzed and rejected with respect to claim 16 above.

RE claim 8, the sound reproduction system in claim 7 in which the preconditioner filter means (fig.19), However, Arai et al. fail to disclose of the system wherein the preconditioner filter being of the equation form $H_2 = (1 - Re^{(-j\omega t)}) R < 1$; However, official notice is taken the equation of form $H_2 = (1 - Re^{(-j\omega t)}) R < 1$ is simply a transform function which is commonly used/known in the art, thus it would have been obvious for one of the ordinary skill in the art to have modify Arai et al. by incorporating the transform function of $H_2 = (1 - Re^{(-j\omega t)}) R < 1$ for creating three dimensional sound field with no influence by the acoustics in the entire space.

Similarly, Re claim 10, A sound reproduction system as claimed in claim 9 in which the filter means ($H_{sub.1}$, $H_{sub.2}$) with the sound pressure at the speaker with transfer function and volume velocities of the speaker (par [0107-0108]), However, Arai et al. fail to disclose of the having the formula wherein the function of

calculating the vector of complex pressures $p = [p_{sub.1} p_{sub.2}]^{sup.T}$ using an equation of the form $p = p_{sub.p} + Zq_{sub.s}$ where $p_{sub.p}$ is the pressure at the head position of the second user due to the primary sound source of said first speaker means, and Z is the matrix of acoustic impedances between p and $q_{sub.s}$ of the second speaker means, and $q_{sub.s} = q_{sub.s,opt} = -Z^{sup.-1} p_{sub.p}$ where the complex volume velocities of the speakers of the second speaker means are $q_{sub.s} = [q_{sub.s1} q_{sub.s2}]^{sup.T}$. However, official notice is taken the concept of having a formula with a complex pressure and volume velocities of speaker is commonly known in the art, thus it would have been obvious for one of the ordinary skill in the art to have modify Arai et al. by incorporating the specific formula with pressure complex and further calculating the vector of complex pressures $p = [p_{sub.1} p_{sub.2}]^{sup.T}$ using an equation of the form $p = p_{sub.p} + Zq_{sub.s}$ where $p_{sub.p}$ is the pressure at the head position of the second user due to the primary sound source of said first speaker means, and Z is the matrix of acoustic impedances between p and $q_{sub.s}$ of the second speaker means, and $q_{sub.s} = q_{sub.s,opt} = -Z^{sup.-1} p_{sub.p}$ where the complex volume velocities of the speakers of the second speaker means are for creating three dimensional sound field with no influence by the acoustics in the entire space.

Allowable Subject Matter

6. Claims 2, 3 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Disler Paul whose telephone number is 571-270-1187. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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